AMENDMENTS TO THE SPECIFICATION

Please add the following paragraphs to the Specification after paragraph [0066]:

[0067]   USING A PROGRAMMING LANGUAGE FOR DATA TRANSFORMATIONS

[0068]   The extraction of business data from the various application entities and its complex representation on the XML document which adheres to a given standard, requires complex set of mapping. This complex mapping amounts to the creation of a high level programming language which sits on top of the complex database entities and the XML representation and the nodes at the same time.

[0069]   The creation of the programming language with a easy to use interface and the ability to represent the complex mapping in the database of the choice Oracle, and the most efficient language which can extracts data from the Oracle Database i.e. PL/ SQL, is what unique about the solution provided by the approach described herein. This mapping tool provides the capabilities of a typical programming language, for example:

- Define variables with data types and with default values.

- Assignment operations Conditional statement evaluation (<, >, =, !=, null, not null, etc)

- Mathematical functions like add, subtract, divide and multiply.

Since this requires high performance, the GUI tool generates ID's which are directly used by the code to fetch the data on the id as the index provides the fastest performance in the PL/SQL layer.

[0070]   DIRECT DATA TRANSFORMATIONS

[0071]   When the data is extracted from and consumed into the various entities, typically 80% can be done straight from entities. But for the remaining 20%, a capability is provided to

make calls to PL/SQL procedures and functions. A unique ability to tie the entities and the

PL/SQL procedures and functions, and represent it as a business transaction is also what is

unique about the solution provided by the approach described herein.

[0072] The processing sequence of a three-level document by an XML gateway

execution engine according to the approach described herein is provided in Table 3-5 below.

TABLE 3-5

LEVEL	STAGE
Root	Pre-Process
Root	In-Process
Header	Pre-Process
Header	In-Process
Header	Post-Process
Line	Pre-Process
Line	In-Process
Line	Post-Process
Line Detail	Pre-Process
Line Detail	In-Process
Line Detail	Post-Process
Root	Post Process

Given the processing sequence described above, header data is processed before line data and

line data is processed before detail data. Any upper level data element that has a dependency on a

lower level data elements (for example, sum of invoice lines) must be processed using an API

call at the upper level. Once the upper level data is processed, it cannot be updated although it

can always be accessed.

[0073] An action can be applied at any of the following stages of message creation or

consumption:

• Pre-Process

A pre-process action is executed before the message is created or consumed. The Create

Global Variable action is an example of a preprocess action. The variable must be

defined before it can be used.

- In-Process

An in-process action is executed during message creation or consumption. The Math and

String Functions are examples of in-process actions that are used to manipulate a value.

- Post-Process

A post-process action is one that is executed after the message is created or consumed.

The Insert into Database Table action is an example of a post-process action: The row

cannot be inserted into the database until all the data for the row has been processed.

[0074]   TRANSACTIONAL CONTROL

[0075]   The approach described herein provides transactional control at each entity level

with pre-, in-, and post-processing capability.

[0076]   As part of the element mapping process, actions for data transformation or

process control can be defined. Actions are similar to pre-built functions in that they may be

called to perform a specific activity. In one embodiment, an XML gateway supports actions for

data transformation involving math functions, string manipulations, and data conversion. In this

embodiment, the XML gateway supports a set of pre-defined actions for process control. This

includes user-defined procedure and function calls. Other common process control actions allow

inquiries on the status of a transaction and to manage the process flow based on the status. For

serious errors, the transaction can be aborted and an error message can be returned to the sender.

[0077]   An action may be defined for any of the following entities:

- Element

An element is the smallest unit of a message. An action defined at the element level is

applied to that element only.

- Document

  A document is a collection of elements representing a business document. An action

  defined at the document level is applied to the document.

- Root

  A root represents a collection of documents. An action defined at the root level is applied

  to all documents contained by the root.

In addition, some actions are designed to be applied to the element only, while others are

intended for the document only.